









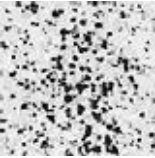
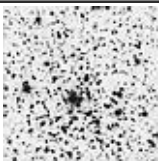
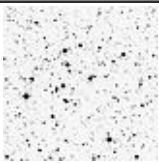

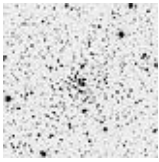
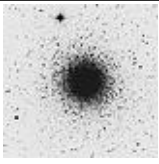
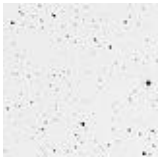
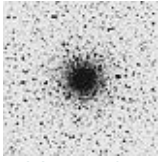
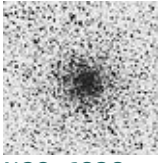


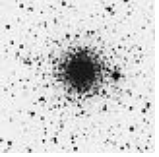
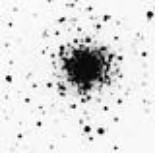
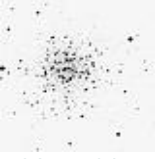

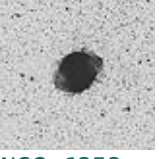
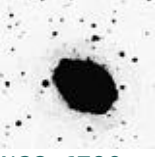

# The Calendar-Sky



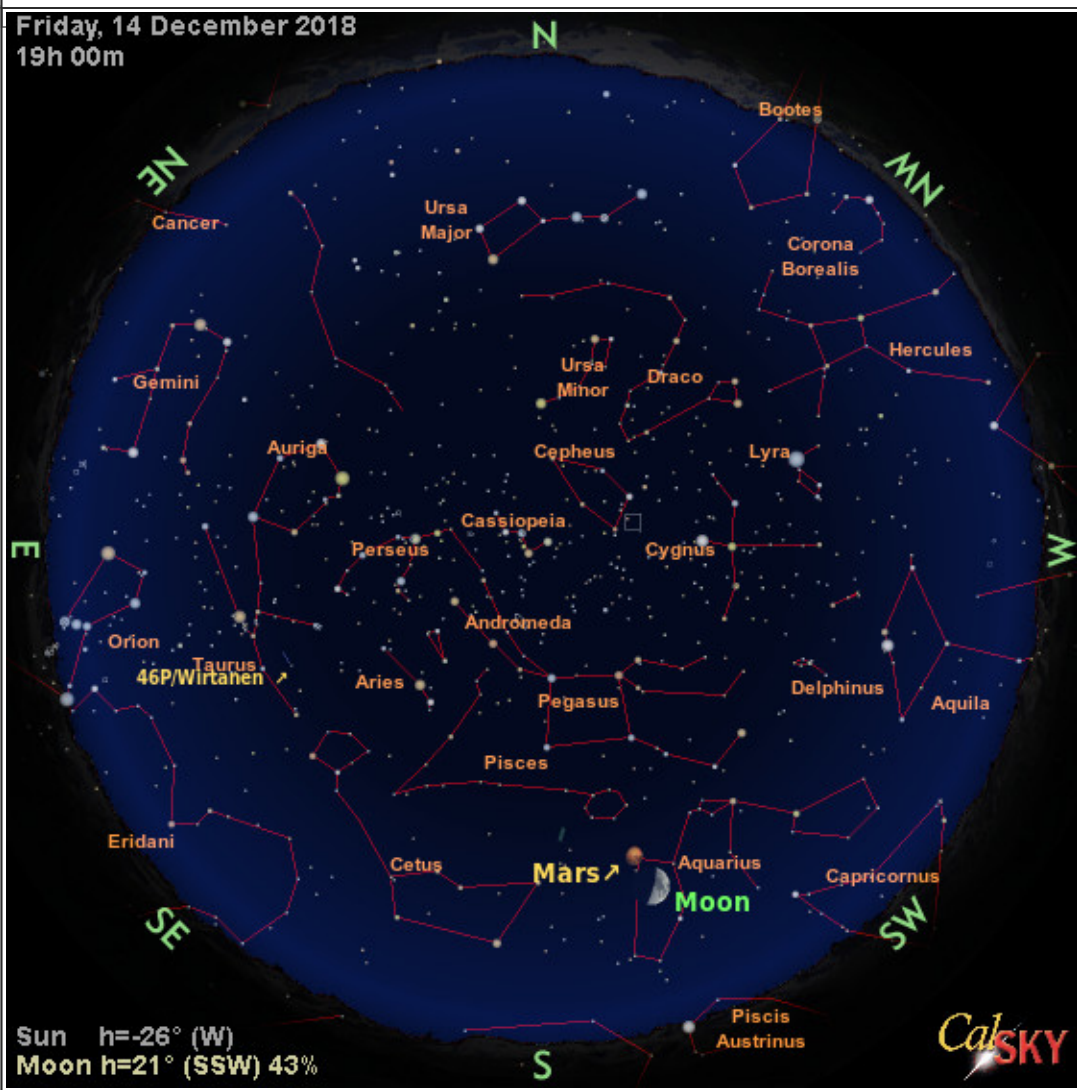
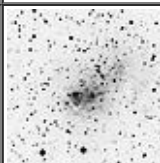


## Friday 14 December 2018

Time (24-hour clock)	Object (Link)	Event
	Observer Site	JSLObs, United Kingdom WGS84: Lon: -4d05m30.33s Lat: +57d28m38.01s Alt: 205m Geoid Alt: 152m All times in GMT or BST (during summer)
19.0h	 Mars	Magnitude= 0.2mag Best seen from 15.9h -23.5h (h <sub>top</sub> =22° at SE at 15.9h) (in constellation Aquarius) RA=23h17m46s Dec= -5°20.5' (J2000) Distance=1.119AU Elongation= 86° Phase k=86% Diameter=8.4" planetographic latitude of the Earth=-26.2°
19.0h	 Uranus	Magnitude= 5.8mag Best seen from 17.2h - 3.0h (h <sub>top</sub> =43° at S at 20.5h) (in constellation Pisces) RA= 1h46m57s Dec=+10°27.3' (J2000) Distance=19.268AU Elongation=126° Diameter=3.6"
19.0h	 Neptune	Magnitude= 7.8mag Best seen from 17.6h -21.3h (h <sub>top</sub> =25° at S at 17.7h) (in constellation Aquarius) RA=23h00m52s Dec= -7°22.2' (J2000) Distance=30.076AU Elongation= 81° Diameter=2.2"
19.0h	 Pluto	Magnitude=14.3mag Best seen from 17.6h - 6.8h (in constellation Sagittarius) RA=19h25m40s Dec=-22°03.4' (J2000) Distance=34.572AU Elongation= 27° Diameter=0.1"
19.0h	 Schwassmann-Wachmann →Star chart	Comet '29P' <b>Magnitude=12.8mag</b> Best seen from 17.6h -22.0h (h <sub>top</sub> =32° at S at 17.6h) (in constellation Pisces) RA=22h51m31s Dec= -0°37.0' (J2000), hourly motion: 14.5"/h Position angle= 72.3° dRA= 0.9sec/h dDec= 4.4"/h, Distance to Sun= 5.77AU, Distance to Earth= 5.83AU, Elongation= 82°, h=29.6° az=204.6°/SSW, Sun altitude=-26°, Elongation from Moon center=11°, Moon elevation=21° SSW, Moon phase=43%
19.0h	 Stephan-Oterma →Star chart	Comet '38P' <b>Magnitude= 9.8mag</b> Best seen from 18.7h - 6.8h (h <sub>top</sub> =67° at S at 3.1h) (in constellation Lynx) RA= 8h26m00s Dec=+34°09.3' (J2000), hourly motion: 67.7"/h Position angle= 25.2° dRA= 2.3sec/h dDec= 61.2"/h, Distance to Sun= 1.64AU, Distance to Earth= 0.77AU, Elongation=140°, h=13.6° az=45.9°/NE, Sun altitude=-26°, Elongation from Moon center=136°, Moon elevation=21° SSW, Moon phase=43% Position angle of ion tail=267° (re zenith=295°), Length of a 0.05AU long tail=27', Position angle of dust trail (not tail)=205° (re zenith=233°), Orbit direction=94° (almost parallel to Earth, towards Earth; dust trail would be long but faint), Latitude of Earth above orbit plane=-2° (Earth close to orbit plane - a tail would relatively easy to be seen)
19.0h	 Wirtanen →Star chart	Comet '46P' <b>Magnitude= 5.7mag</b> Best seen from 17.2h - 5.8h (h <sub>top</sub> =48° at S at 22.5h) (in constellation Taurus) RA= 3h45m47s Dec=+15°41.5' (J2000), hourly motion: 628.7"/h Position angle= 27.6° dRA= 20.6sec/h dDec=555.6"/h, Distance to Sun= 1.06AU, Distance to Earth= 0.08AU, Elongation=155°, h=33.0° az=114.6°/ESE, Sun


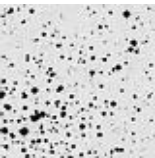

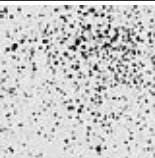
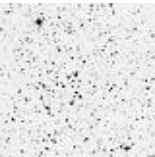

		<p>altitude=-26°, Elongation from Moon center=73°, Moon elevation=21° SSW, Moon phase=43%</p> <p>Position angle of ion tail=69° (re zenith=100°), Length of a 0.07AU long tail=2.9°, Position angle of dust trail (not tail)=208° (re zenith=239°), Orbit direction=98° (almost parallel to Earth, towards Earth; dust trail would be long but faint), Latitude of Earth above orbit plane=-1° (Earth close to orbit plane - a tail would relatively easy to be seen)</p>
19.0h	 <p>Swift-Gehrels →Star chart</p>	<p>Comet '64P' <b>Magnitude=11.9mag</b> Best seen from 17.6h - 5.1h (h<sub>top</sub>=65° at S at 21.0h) (in constellation Triangulum)</p> <p>RA= 2h15m21s Dec=+32°24.7' (J2000), hourly motion: 81.1"/h Position angle=106.9° dRA= 6.1sec/h dDec=-23.8"/h, Distance to Sun= 1.48AU, Distance to Earth= 0.60AU, Elongation=137°, h=57.8° az=128.0°/SE, Sun altitude=-26°, Elongation from Moon center=62°, Moon elevation=21° SSW, Moon phase=43%</p> <p>Position angle of ion tail=92° (re zenith=123°), Length of a 0.05AU long tail=27', Position angle of dust trail (not tail)=287° (re zenith=317°), Orbit direction=40° (away from Earth), Latitude of Earth above orbit plane=-9°</p>
19.0h	 <p>Pan-STARRS →Star chart</p>	<p>Comet 'C/2016 R2' <b>Magnitude=11.9mag</b> Best seen from 17.6h -19.5h (h<sub>top</sub>=21° at NW at 17.6h) (in constellation Bootes)</p> <p>RA=14h59m29s Dec=+40°35.7' (J2000), hourly motion: 44.5"/h Position angle= 93.8° dRA= 3.9sec/h dDec= -3.0"/h, Distance to Sun= 3.45AU, Distance to Earth= 3.62AU, Elongation= 72°, h=13.8° az=329.3°/NNW, Sun altitude=-26°, Elongation from Moon center=121°, Moon elevation=21° SSW, Moon phase=43%</p> <p>Position angle of ion tail=325° (re zenith=303°), Length of a 0.02AU long tail=5', Latitude of Earth above orbit plane=0°</p>
19.0h	<p>(3) Juno →Star chart</p>	<p>Asteroid with <b>Magnitude= 7.8mag</b> Best seen from 18.3h - 2.3h (h<sub>top</sub>=28° at S at 22.3h)</p> <p>RA= 3h35m49.7s Dec= -4°10'23" (J2000) (in constellation Eridani/Eri) Distance to Sun=1.988AU Distance to Earth=1.121AU hourly motion: 16.8"/h Position angle=300.2° dRA= -1.0sec/h dDec= 8.5"/h</p>
19.0h	<p>(433) Eros →Star chart</p>	<p>Asteroid with <b>Magnitude= 9.5mag</b> Best seen from 17.6h - 6.8h (h<sub>top</sub>=87° at N at 23.0h)</p> <p>RA= 4h14m39.5s Dec=+59°58'16" (J2000) (in constellation Camelopardalis/Cam) Distance to Sun=1.191AU Distance to Earth=0.251AU hourly motion: 51.4"/h Position angle=199.0° dRA= -2.2sec/h dDec=-48.6"/h</p>
19.0h	 <p>IC 4756: Open star cluster</p>	<p>IC 4756 <b>Magnitude=5mag Diameter=52'</b> RA=18h39.0m Dec= +5°27' (in constellation Serpens Cauda/Ser) best seen between 16.4h -19.9h (h<sub>top</sub>=27° at SW at 16.4h). cluster, compressed</p>
19.0h	 <p>NGC 6802: Open star cluster</p>	<p>NGC 6802 <b>Magnitude=8.8mag Diameter=3'</b> RA=19h30.6m Dec=+20°16' (in constellation Vulpecula/Vul) best seen between 17.6h -21.8h (h<sub>top</sub>=38° at WSW at 17.6h). cluster, large, very compressed, extended 0 degrees, stars 14...18 mag</p>


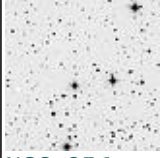


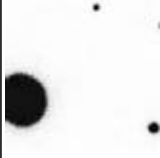
19.0h	 NGC 6834: Open star cluster	<b>NGC 6834</b> Magnitude=7.8mag Diameter=5' RA=19h52.2m Dec=+29°25' (in constellation Cygnus/Cyg) best seen between 17.2h -23.5h (h <sub>top</sub> =51° at WSW at 17.2h). cluster, sparse, little compressed, stars 11...12 mag
19.0h	 NGC 7063: Open star cluster	<b>NGC 7063</b> Magnitude=7mag Diameter=8' RA=21h24.4m Dec=+36°30' (in constellation Cygnus/Cyg) best seen between 16.8h - 3.0h (h <sub>top</sub> =68° at SSW at 16.8h). cluster, sparse, stars 10... mag
19.0h	 NGC 7243: Open star cluster	<b>NGC 7243</b> Magnitude=6.4mag Diameter=21' RA=22h15.3m Dec=+49°53' (in constellation Lacerta/Lac) best seen between 16.8h - 7.6h (h <sub>top</sub> =71° at W at 19.0h). cluster, large, sparse, little compressed, stars very large
19.0h	 NGC 7788: Open star cluster	<b>NGC 7788</b> Magnitude=9mag Diameter=9' RA=23h56.7m Dec=+61°24' (in constellation Cassiopeia/Cas) best seen between 17.6h - 6.8h (h <sub>top</sub> =85° at NNW at 19.0h). cluster, small, pretty rich, very compressed, stars 10 mag, 13...
19.0h	 NGC 7078: Globular star cluster	<b>M 15 (NGC 7078)</b> Magnitude=6.4mag Diameter=12.3' RA=21h30.0m Dec=+12°10' (in constellation Pegasus/Peg) best seen between 16.8h -23.5h (h <sub>top</sub> =44° at SSW at 16.8h). remarkable, globular cluster, very bright, very large, irregular round, very suddenly much brighter in the middle, well resolved, stars very small; = Messier 15
19.0h	 NGC 7089: Globular star cluster	<b>M 2 (NGC 7089)</b> Magnitude=6.5mag Diameter=12.9' RA=21h33.5m Dec= -0°49' (in constellation Aquarius/Aqr) best seen between 16.8h -22.2h (h <sub>top</sub> =31° at S at 16.8h). very remarkable, globular cluster, bright, very large, gradually pretty much brighter (in the) middle, well resolved, stars extremely small; = Messier 2
19.0h	 NGC 6779: Globular star cluster	<b>M 56 (NGC 6779)</b> Magnitude=8.3mag Diameter=7.1' RA=19h16.6m Dec=+30°11' (in constellation Lyra/Lyr) best seen between 17.6h -23.1h (h <sub>top</sub> =44° at WSW at 17.6h). globular cluster, bright, large, irregular round, gradually very much compressed (in the) middle, well resolved, stars 11...14 mag; = Messier 5
19.0h	 NGC 6838:	<b>M 71 (NGC 6838)</b> Magnitude=8.3mag Diameter=7.2' RA=19h53.8m Dec=+18°47' (in constellation Sagitta/Sge) best seen between 17.6h -22.0h (h <sub>top</sub> =39° at WSW at 17.6h). cluster, very large, very rich, pretty much compressed, stars 11...16 mag; = Messier 71

	Globular star cluster	
19.0h	 NGC 6934: Globular star cluster	<b>NGC 6934 Magnitude=8.9mag Diameter=5.9'</b> RA=20h34.2m Dec= +7°24' (in constellation Delphinus/Del) best seen between 17.6h -21.4h (h <sub>top</sub> =33° at SW at 17.6h). globular cluster, bright, large, round, well resolved, stars 16... mag, star 9 mag preceding (westward)
19.0h	 NGC 7006: Globular star cluster	<b>NGC 7006 Magnitude=10.6mag Diameter=2.8'</b> RA=21h01.5m Dec=+16°11' (in constellation Delphinus/Del) best seen between 17.6h -21.9h (h <sub>top</sub> =44° at SW at 17.6h). bright, pretty large, round, gradually brighter (in the) middle
19.0h	 NGC 7492: Globular star cluster	<b>NGC 7492 Magnitude=11.5mag Diameter=6.2'</b> RA=23h08.4m Dec=-15°37' (in constellation Aquarius/Aqr) best seen between 17.6h -20.0h (h <sub>top</sub> =17° at S at 17.9h). extremely faint, large, cluster of extremely faint stars
19.0h	 NGC 7662: Planetary nebula	<b>Blue Snowball (NGC 7662) Magnitude=9mag Diameter=2.2'</b> RA=23h25.9m Dec=+42°33' (in constellation Andromeda/And) best seen between 17.6h - 6.8h (h <sub>top</sub> =73° at SW at 19.0h). magnificent or interesting planetary nebula or ring, very bright, pretty small, round, blue, variable nucleus
19.0h	 NGC 6853: Planetary nebula	<b>Dumbbell nebula, M 27 (NGC 6853) Magnitude=8.1mag Diameter=15.2'</b> RA=19h59.6m Dec=+22°43' (in constellation Vulpecula/Vul) best seen between 17.2h -22.6h (h <sub>top</sub> =46° at SW at 17.2h). magnificent or interesting, very bright, very large, binuclear, irregular extended ( Dumbbell ); = Messier 27
19.0h	 NGC 6720: Planetary nebula	<b>M 57, Ring nebula in Lyra (NGC 6720) Magnitude=9mag Diameter=2.5'</b> RA=18h53.6m Dec=+33°02' (in constellation Lyra/Lyr) best seen between 17.6h -23.3h (h <sub>top</sub> =43° at W at 17.6h). magnificent or interesting, ring, bright, pretty large, considerably extended ( in Lyra ); = Messier 57
19.0h	NGC 40:  Planetary nebula	<b>NGC 40 Magnitude=11mag Diameter=0.6'</b> RA= 0h13.0m Dec=+72°32' (in constellation Cepheus/Cep) best seen between 17.6h - 6.8h (h <sub>top</sub> =75° at N at 19.0h). faint, very small, round, very suddenly much brighter in the middle, star 12 mag south preceding
19.0h		<b>NGC 6803 Magnitude=11mag Diameter=0.1'</b> RA=19h31.3m Dec=+10°03' (in constellation Aquila/Aql) best seen

	 <p>NGC 6803: Planetary nebula</p>	<p>between 17.6h -19.8h (<math>h_{top}=29^\circ</math> at WSW at 17.6h). planetary nebula, stellar</p>
<p>19.0h</p>  <p>Star chart</p>		 <p>Friday, 14 December 2018 19h 00m</p> <p>Sun <math>h=-26^\circ</math> (W) Moon <math>h=21^\circ</math> (SSW) 43%</p> <p>CalSKY</p>
<p>19.1h</p>  <p>IC 10: Galaxy</p>		<p>IC 10 Magnitude=10.3mag Diameter=5.1' RA= 0h20.4m Dec=+59°18' (in constellation Cassiopeia/Cas) best seen between 17.6h - 6.8h (<math>h_{top}=88^\circ</math> at N at 19.1h). faint star involv(ed)(ing) in extremely faint, very large nebula(e)</p>
<p>19h14m32s</p>  <p>COSMO- SkyMed 4</p>		<p>Flare from unknown Mirror Magnitude= 2.4mag Azimuth=215.7° SW altitude= 22.3° in constellation Aquarius RA=22h20.5m Dec= -4°48' Flare angle=4.30° In a clock-face concept, the satellite will seem to move toward 6:49 Angular Velocity=11.1'/s</p>  <p>Flare center line, closest point →MapIt: Longitude=0.967°W Latitude=+57.380° (WGS84) Distance=187.2 km Azimuth= 92.0° E Peak Magnitude=-0.2mag Satellite above: longitude=13.9°W latitude=+46.9° height above Earth=629.4 km distance to satellite=1360.4 km Altitude of Sun=-27.9° This is an experimental flare prediction. Brightness estimate may be unreliable. Please report a successful observation (Object/site coordinates/date/measured time/accuracy/magnitude).</p>



19h39m53s	 <b>COSMO-SkyMed 1</b>	<p>Flare from unknown Mirror Magnitude= 1.6mag  Azimuth=226.1° SW altitude= 9.9° in constellation Capricornus  RA=21h50.3m Dec=-12°53'  Flare angle=1.86°  In a clock-face concept, the satellite will seem to move toward 7:17  Angular Velocity=6.9'/s</p> <p>Flare center line, closest point →MapIt: Longitude=7.117°W  Latitude=+57.082° (WGS84) Distance=187.0 km Azimuth=257.7° WSW Peak Magnitude=-0.1mag  Satellite above: longitude=20.1°W latitude=+46.5° height above Earth=629.3 km distance to satellite=2014.5 km  Altitude of Sun=-31.2°  This is an experimental flare prediction. Brightness estimate may be unreliable. Please report a successful observation (Object/site coordinates/date/measured time/accuracy/magnitude).</p>
20.4h	(6) Hebe →Star chart	<p>Asteroid with Magnitude= 8.5mag  Best seen from 20.4h - 6.2h (h<sub>top</sub>=37° at S at 1.3h)  RA= 6h36m40.6s Dec= +4°03'56" (J2000) (in constellation Monoceros/Mon)  Distance to Sun=2.192AU Distance to Earth=1.262AU  hourly motion: 37.7"/h Position angle=286.8° dRA= -2.4sec/h dDec= 10.9"/h</p>
20.4h	 NGC 659: Open star cluster	<p>NGC 659 Magnitude=7.9mag Diameter=5'  RA= 1h44.2m Dec=+60°42' (in constellation Cassiopeia/Cas) best seen between 17.2h - 7.2h (h<sub>top</sub>=87° at N at 20.4h).  cluster, little rich, stars bright</p>
20h30.5m	 Uranus	<p>Transit Altitude=+43.1° (in constellation Pisces) Elongation=126.0° East, Magnitude=5.8mag</p>
20.6h	 IC 166: Open star cluster	<p>IC 166 Magnitude=11.7mag Diameter=5'  RA= 1h52.5m Dec=+61°50' (in constellation Cassiopeia/Cas) best seen between 17.6h - 6.8h (h<sub>top</sub>=86° at N at 20.6h).  small cluster, nebulous?</p>
20.7h	 NGC 744: Open star cluster	<p>NGC 744 Magnitude=7.9mag Diameter=11'  RA= 1h58.4m Dec=+55°29' (in constellation Perseus/Per) best seen between 17.2h - 7.2h (h<sub>top</sub>=88° at S at 20.7h).  cluster, pretty large, pretty rich, irregular figure, stars 11...13 mag</p>
21.1h	 NGC 895: Galaxy	<p>NGC 895 Magnitude=11.8mag Diameter=3.6'  RA= 2h21.6m Dec= -5°31' (in constellation Cetus/Cet) best seen between 17.6h - 0.9h (h<sub>top</sub>=27° at S at 21.1h).  faint, very large, irregular round, gradually brighter (in the) middle, double nebula(e) with 894, connected</p>
21.1h		<p>Double cluster (NGC 884) Magnitude=4mag Diameter=30'  RA= 2h22.4m Dec=+57°07' (in constellation Perseus/Per) best seen between 16.4h - 8.0h (h<sub>top</sub>=90° at S at 21.1h).  remarkable cluster, very large, very rich, ruby star (in the) middle</p>

	 <p>NGC 884: Open star cluster</p>	
21.2h	 <p>NGC 956: Open star cluster</p>	<p><b>NGC 956 Magnitude=9mag Diameter=8'</b>  RA= 2h32.4m Dec=+44°39' (in constellation Andromeda/And) best seen  between 17.6h - 6.8h (<math>h_{top}=77^\circ</math> at S at 21.2h).  cluster, pretty rich, stars 9...15 mag</p>
21.5h	 <p>Deep- Sky Observing</p>	<p><b>Best time interval for observing dim objects: 21.5h- 6.8h (9.3 hours)</b>  Prior to midnight</p>
22.9h	 <p>NGC 1514: Planetary nebula</p>	<p><b>NGC 1514 Magnitude=10mag Diameter=1.9'</b>  RA= 4h09.2m Dec=+30°47' (in constellation Taurus/Tau) best seen  between 17.6h - 6.8h (<math>h_{top}=63^\circ</math> at S at 22.9h).  star 9 mag in nebula(e) 3' diameter</p>
22.9h	 <p>NGC 1535: Planetary nebula</p>	<p><b>NGC 1535 Magnitude=10mag Diameter=0.7'</b>  RA= 4h14.2m Dec=-12°44' (in constellation Eridani/Eri) best seen  between 20.2h - 1.7h (<math>h_{top}=20^\circ</math> at S at 22.9h).  planetary nebula, very bright, small, round, pretty small, very  suddenly brighter (in the) middle, resolvable</p>

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